

set in which eventually overspread the entire district, giving generous and in some places excessive rains during the period 14th-18th. The last decade of the month was generally showery, giving ample moisture for all purposes, and yet not continuous enough to greatly interfere with harvesting.

Excessive 24-hour amounts occurred at numerous places and on various dates during the month, but particularly in Ohio and Indiana about the 16th and 17th. On the 16th, 3.25 inches fell at Salamonina, Ind., between 10 a. m. and 12 noon, while at a number of places in Ohio between 3 and 4 inches fell in 24 hours on that day. On the 25th, 4.47 inches fell at Rock House, N. C., in 24 hours, 3 inches of which fell in two hours. Table 2, Daily Precipitation for June, 1912, shows many excessive 24-hour rainfalls.

MISCELLANEOUS.

DAMAGE FROM STORMS AND LIGHTNING.

June 15-17.—Beginning during the night of the 15th and continuing through the 16th and much of the 17th a series of severe local storms passed over considerable areas in Kentucky, Illinois, Indiana, Ohio, and western Pennsylvania, resulting in much local damage from wind squalls, lightning, downpours of rain, and now and then hail. These storms were especially severe in the northern counties of western Kentucky, east central counties of Indiana, central and southern Ohio, and over southwestern Pennsylvania. The following are extracted from special reports by J. M. Kirk, observer, local office, Weather Bureau, Columbus, Ohio, and George S. Bliss, Section Director, Philadelphia, Pa.

SEVERE STORMS OF JUNE 16, 1912.

J. M. KIRK, Observer.

A number of unusually severe storms occurred in Ohio on Sunday, June 16. The storms were noteworthy for both the severity of the lightning and the destructive force of the winds, which in some instances showed almost tornadic violence. While observers at Delaware and Zanesville report that funnel-shaped clouds were seen, judging from the position of the fallen trees and other debris, it is believed that, with these possible exceptions, the winds were straight thunder squalls. There were at least four distinct storm periods during the day.

The first storm occurred at about 5 a. m. in the southwestern corner of the State. At Cincinnati a number of persons were injured, signs, trees, fences, chimneys, etc., were blown down, and windows were blown in and broken in various parts of the city. Considerable damage was done to river craft and the steeple of St. Peter's Church was tilted to a dangerous angle. An extreme velocity of 55 miles per hour from the southwest was recorded at the Weather Bureau office at 4.54 a. m. In the vicinity of Sevenmiles, Butler County, three barns were wrecked and much damage was done to trees and crops.

The storm passed over Dayton between 5 and 5.10 a. m. The path of greatest destruction was across the southern part of the city and varied in width from 500 to 1,000 feet. The first evidence of damage was in the part of the city called Edgemont, then there was a skip to the fair grounds, where a portion of the grand stand was blown away and several trees blown down; then another skip of one-half mile, to Wayne Avenue, where, within a radius of three blocks, two houses and one barn were wrecked, one barn blown into the street, a number of roofs blown off, much damage done to chimneys, windows, and trees, and three persons slightly injured. From that place another skip of 2 miles was made to the Smithville Pike, where a house and barn were destroyed.

Considerable damage was done by this storm in Springfield and vicinity also. A house was blown down and several buildings unroofed. Several miles north of Springfield a large barn was destroyed by lightning and six horses and 5 cows that were in the building were burned.

The second storm occurred in Muskingum County and passed over Zanesville at 6.40 a. m. The destruction to life and property here was much greater than in any other locality of the State. The storm moved from west to east and the path of greatest destruction was from 300 to 500 feet wide. A large number of buildings were wrecked or badly

damaged, hundreds of trees were blown down, and telephone, electric railway, and light service was completely demoralized for the rest of the day. During the progress of the storm the spire of St. Thomas's Church was wrecked and it crashed through the roof onto the heads of the large congregation, killing two and injuring a large number of others. The total number of people reported injured in the church and other parts of the city was 32.

The third disturbance occurred in the northwestern quarter of the State during the middle of the forenoon. It was accompanied by heavy rain and the electrical discharges seem to have been unusually severe. Much damage was done to the telephone systems by lightning.

The fourth storm occurred about noon and was felt in all of the middle counties of the State. While high wind was experienced throughout most of the State during this storm, winds of destructive force swept only small scattered areas. The paths were generally narrow and extended from west to east. A maximum velocity of 54 miles from the northwest was recorded at 11.30 a. m. at Dayton, but no serious damage seems to have been done by this storm until it reached the eastern end of Clark County. Here, from Orchard to Summerford, a distance of 4 miles, it swept a path about 60 rods in width, destroying three houses, six barns, and a number of orchards, and injuring several people.

Much damage was done at Plain City and Kile in northern Madison County and in various parts of Union County. At Plain City the Universalist church was demolished and a number of business houses and residences were unroofed and badly damaged. At Kile an elevator was blown over and the railroad station was moved from its foundation. In Delaware and Franklin Counties the damage was heavy. The storm passed over Delaware at 12.21 p. m. and Columbus at 12.25 p. m. At Delaware the path of greatest destruction was across the center of the city. A number of the business houses were unroofed and the contents of the buildings damaged by the rain. The roof of the Catholic school building was blown across the street where it damaged two residences. The damage throughout the county was severe and the total was variously estimated at from \$25,000 to \$50,000.

In Franklin County the villages of Dublin, Grove City, and Worthington suffered most severely. In Worthington one house was demolished and the owner was crushed to death in the ruins; several other buildings were unroofed and several people were injured. In Columbus, where an extreme velocity of 76 miles per hour was registered, the amount of damage done was comparatively light. The roof of a flour mill was blown off and a number of signs and trees were blown down. At the large Hartman stock farm, a few miles south of Columbus, one barn was completely demolished, another one was badly twisted, and a third, in which were 100 cattle, was unroofed. Three valuable horses and a number of cattle were injured. A large orchard was laid waste and much damage was done to fences.

In Licking County the greatest destruction occurred in the southwestern townships. At Wagram several barns, a church, and a house were blown down and a number of other buildings were unroofed. Minor losses were reported from all parts of the county.

Considerable damage to property was reported in Knox, Morrow, Athens, and Morgan Counties also. In northern Morgan County four barns and a house were wrecked.

The loss sustained by the telephone companies on this date was heavy throughout the State, but it was especially severe in the vicinity of Columbus. During the afternoon every toll line of the Central Union Telephone Co., going out of Columbus was out of commission. Their wires were down in every direction and about 500 of their poles were broken off. The loss to this company was nearly \$10,000. The Citizens Telephone Co., lost 165 poles.

The electric railway companies operating in the vicinity of Columbus suffered much loss also, both in damage to property and hindrance to traffic.

Mr. Bliss reports severe storms passed over the southern half of western Pennsylvania on the 16th and 17th, causing heavy property losses and killing at least two persons, besides a number of cattle and horses. On the 16th the newspapers reported a tornado in Washington and Green Counties, and from the general description of its operations there can be little doubt that it was a storm of that character. A little girl was killed by flying debris. The storms caused almost complete destruction over a well-defined path about 100 yards wide. During a severe thunderstorm on the 17th a man was killed by lightning near Mount Pleasant, in Westmoreland County, while six persons in other parts of the same county are known to have been badly burned or severely shocked by lightning on the same date. The heavy rainfall during these storms caused many washouts, delaying traffic and destroying growing crops.

In addition to the damage done in Ohio and Pennsylvania, two persons were killed in Indiana, several barns and other property to the extent of many thousands of dollars in value were destroyed or damaged in that State and Kentucky by wind and lightning.

June 17.—Henry Gillett was killed and his son severely shocked by lightning at Sparta, Tenn.

June 20.—Hail and lightning caused considerable damage in southern Illinois. In Vermilion County several head of horses, sheep, and other stock were killed, houses damaged, and persons stunned by these storms. The torrential rains also caused some damage to crops.

June 23.—Damaging hailstorms occurred at Wellsburg, W. Va., and New Alexandria, Ohio.

June 25.—At Fayetteville, Tenn., lightning struck the Christian Church, doing considerable damage and stunning several persons.

June 27.—Lightning did considerable damage near Lewisburg, W. Va. A man was killed by lightning at Lebanon, Tenn.

June 29.—A farmer was killed by lightning at Bowling Green, Ky., and two mules were killed by lightning near Beattyville, Ky.

June 30.—Slight damage was done by lightning in some localities in Tennessee, Kentucky, and Indiana.

RIVERS AND STREAMS.

A fairly good navigable stage of water obtained in the middle and lower reaches of the Ohio during the entire month. It was quite low at times, however, in the upper stretches and navigation was kept open only by raising of wickets in the improvement dams and the maintenance of pools. A sharp temporary rise resulted from the general rains about the middle of the month. The Tennessee River was open to navigation during the entire month, but the Cumberland River was closed on account of low water after the 6th except where navigable stages were artificially maintained.